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ABSTRACT

Working with a word processor changes writers' behavior. They compose more easily, less anxiously, and more prolifically. The word processor makes them want to sit down and write and makes them feel good about their writing. It does this by encouraging prewriting and invention, by providing a sense of control and mastery over the actual writing process, by easing the burden of rewriting and editing, and by encouraging a kind of objectivity that allows writers to become their own audience. In the process writing style may be changing, becoming more like speech in its spontaneity; this is because the word processor, in emphasizing language as a kind of raw material, frees writers and thinkers from a static commitment to their words. Instead the writer continues to revise and rethink up to the very last keystroke. These are only the obvious effects of the use of the word processor. It took years for writing to stop imitating oral language, and word processing programs still imitate the typewriter and the printing press. Thus, writers have probably not yet experienced the full stylistic potential of electronic writing. (RBW)

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WORD PROCESSING AND WRITING BEHAVIOR

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WORD PROCESSING AND WRITING BEHAVIOR

We are experiencing what the popular press terms a "word processing boom": one hundred manufacturers enjoyed word processor sales of 2.1 billion dollars in 1982, and sales are expected to jump 30% annually in the next five years--to 7.3 billion in 1985 (Glynn). The fact is that computers are used more for word processing than for any other purpose in American businesses. And 76% of all home computers are now used for word processing (Sandberg-Dement). Journalists moved wholesale to word processing in the early seventies, professional writers have turned to computers, and university and college students are discovering that the word processor "is the single greatest boon to writing, rewriting, and editing since the blue pencil" (Turner 1).

Word processing, an accidental by-product of computer development, is clearly becoming a universal tool in human discourse. Increasingly, human thought and writing will be filtered and screened by the processor. But we have hardly considered the implications of a world in which most of our thinking and writing is done on the electronic page. I believe it will significantly change the process of writing itself.

Word processing affects the output, the creation and organization of our meanings in words. In Orality and Literacy Walter Ong suggests that "writing and print and the computer are all ways of technologizing the word"; rather than "mere exterior aids," tools represent "interior transformations of consciousness"

-- especially when they affect the word (80,81). Some will fear the new technology, but the shaping of a tool so that it becomes a part of us, an extension into the world, is not a dehumanizing experience. It can extend our abilities to function in the world, express our perceptions of self, and connect us with others. My intent here is to examine the effects of word processing on the process, the style, and the thought of writers. The following paper, then, represents an initial attempt to examine the effects of word processing on the way writers write and think about writing.

THE REACTION TO WORD PROCESSING

Most of the literature on word processing falls into two broad categories: the pedagogical and the evangelical. The "how-to" writers supply us with all sorts of unneeded technical data and tell us which word processing software they think is best. The evangelicals speak only in hyperbole, hailing computer-assisted writing as the greatest invention since the pencil, moveable type, or the wheel.

It is no wonder that some commentators seem a bit cynical, like the New York Times writer who attacked the "typographic pyrotechnics" of word processing as "the emperor's new words," an "exercise in verbose verbiage" (Sandberg-Dement, 19). Or the Newsweek columnist who praised the pencil as the world's greatest word processor in a parody entitled "The Pencil Revolution" (Lacy 84). Or nature writer Edward Abbey, on a camping trip in Alaska: "I activate my word processor. It's a good one. User-friendly, cheap, silent, no vibrations or radiation, no moving parts, no

maintenance, no power source needed, easily replaceable, fully portable--it consists of a notebook and a ball-point pen from 'Desert Trees, 9559 N. Camino del Plata, Tuscon, Ariz.'The necessary software must be supplied by the operator . . ." (174).

Such parodies, no matter how devastating, only indicate that the technology, even as it is being resisted, is creating a new way of thinking about words, ideas, and the tools of writing. It is impossible to parody something that is not already assimilated. Thus, to use a McLuhanesque term, the new technology is "interiorized," our senses are extended, and "a new translation of culture occurs . . ." (Gutenberg 40). The new technology has, in fact, created the basis for the parody.

WRITING ANXIETY

On a more conscious level, however, we have yet to examine the probable effects of computer-assisted writing. What little information we do have comes from the testimony of individual writers or from scattered studies of composition classes. Nevertheless, some effects are consistently mentioned. Working with a word processor is always credited with relieving writing anxiety. For example, a teacher of English characterized himself in a recent article as a blocked writer--but on the processor

> . . .the words fly up on the screen, not ink on paper but images that, with a single keystroke, can be erased, filed, moved, changed. 'Nothing permanent here,' I feel, 'What I'm putting up on the screen is just images; no need to worry,' And so the editor takes to the sidelines, allowing the creator to

> produce language, both good and bad. The editor is called in later, at the appropriate time, to cut, paste, add, delete. I produce much more now . . . and I produce more with less effort (Moran 113-4).

Such a response is typical of the testimony of writers who have experienced word processing. "I've yet to hear of a writer," says James Fallows in the Atlantic, "who has used a computer and has willingly switched back to a typewriter or quill pen" ("Computers" 101). Part of the reason for this is purely technololgical. The word processor's powerful editing and formatting capabilities save the writer time and effort. Word-wraparound, scrolling, and a running cursor are only the most visible features of a writing tool that allows revision and editing on a scale unmatched by any conventional procedures. Unlike revising on paper, insertions, deletions, and reorganizations are not cause for extra work. We can merge texts, search and combine files, even automatically correct spelling and grammar, and still always be able "to work with freshly typed scripts, confident that any sorts of changes can be quickly incorporated into a new draft" (Bean 146-7).

Since it is so easy, and since it can always produce a perfectly typed text without time-consuming recopying, word processing encourages revision. It encourages us to refine and readjust, to reorganize, to play with words. We look forward to revising and editing. Studies indicate that writers write more, enjoy the process of writing more, and spend more time at revising (Collier). The word processor also makes writers feel good about their writing, makes them want to sit down and write--which is

often half the battle. Some even wonder whether revising will become too seductive--whether we will revise the guts out of our writing.

Actually the ease with which we can revise on a word processor allows us to put more into our writing, allows a greater freedom and spontaneity. The problem most writers have lies not in too much editing but in editing much too early, in thinking about the final product before they have sufficiently explored what they have to say. This premature editing usually results in frustration or failure.

Using a word processor can eliminate the anxieties of beginning, the terror of the blank page. On a word processor one always begins in the middle of the action. The page scrolls out of sight. Margins automatically justify themselves. Because the electronic page is so impermanent, because we know it can be easily changed or erased, we write with less anxiety. We can risk saying something stupid or silly, knowing we can erase it with the touch of a key. We can insert material whenever it seems easiest. Even after wholesale global revision, our writing can be quickly formatted and printed to produce a perfectly typed page. Contrast this with <u>type</u> writing, where we must work with a printing press at our fingertips while we are still trying to discover what we have to say. We compose with solid, hard, immoveable characters. Once set, the lines are rigid. Error and change create serious consequences. It's hard not to be anxious.

INVENTION AND REVISION

The emphasis is on transcription rather than composition.

Such a focus on the final product (or in our schools on the "basics" of grammar and mechanics) can obscure the primary importance of writing as a means of generating, organizing, and discovering what we have to say, of making meanings. It's also hard to get new ideas into such a system. Typography, as Marshall McLuhan pointed out in The Gutenberg Galaxy: The Making of Typographic Man, "tends to alter language from a means of perception and explanation to portable commodity" (161).

Writing on a word-processor puts some needed distance between the exploratory process and the final product. There is room for prewriting, for playing with ideas, for invention. Although a letter quality printer may be connected to the word processor, a guarantee that we can have a perfectly typed draft in moments, everything else about word processing suggests writing to be a divergent, open-ended process. Even as we work on a final draft, we can move paragraphs, delete words and sentences, change things around. We can even add new material or do some freewriting in the middle of a finished paragraph--and revise or delete it later .

And we can do all this without worrying in the slightest about making any additional work for ourselves, because our new writing tool will reformat the sentences and paragraphs, rejustify margins, even change the page numbers and footnotes to account for the insertions and modifications. As Collette Daiute says in "The Computer as Stylus and Audience," the text editor "helps writers take risks because the consequences of making mistakes are trivial for their pride as well as for their hands" (136).

Finally, anxieties about writing decrease because the word

processor actively encourages writing, is "interactive." This is accomplished primarily through the effects of a small blinking light called the cursor. Basically, the cursor indicates the point at which words will be displayed on the screen. But unlike the tip of the pen or pencil, it is a constant prompt, a device that solicits interaction with the text, a signal for the writer to do something. Whenever the writer stops writing or giving commmands, the cursor begins blinking, waiting for more text. Some even argue that this invitation for input "encourages the writer to say more and to consider whether what is written makes sense" (Daiute 141).

A SENSE OF MASTERY

In addition to encouraging us to write and take risks, the processor gives us a feeling of mastery over writing. Even the name of the new technology ("word processing") seems to demystify writing. The traditional romanticist attitude toward writing as a magical creative act often leads to frustration when the muse doesn't cooperate. But word processing, like "data processing" (or meat processing) indicates a no-nonsense, pragmatic approach to the task of composing. Writers, like New York freelancer Bernice Hunt, often talk about a sense of mastery in using a word processor: "One has a feeling of power--of control over the process that liberates creativity" (Biagi 8).

The language of computers and computer assisted writing programs also suggests that the writer is in control of the process. The text editor itself is composed of a series of "commands" that the writer can use to manipulate words. (All

activated by a "Control" key!) As difficult as writing is, as recalcitrant and stubborn as words can be, anything that gives the writer control--or even the illusion of control--will seem a blessing beyond all expectations. Normally at the mercy of words and syntax, writers using a text editor can "delete," "retrieve," "search and replace," or "insert" words, phrases, sentences, even paragraphs and larger segments of text. They can file and retrieve words at will, define commonly used words or phrases in a "glossary" for instant shorthand retrieval, and command the printer to justify or center lines on a page. Using a word processor, writers have a veritable arsenal of weapons available, at the touch of a finger, which will literally put words in their places.

Writers also gain control of their time. In Writing and the Writer, Frank Smith's catalogue of writing paraphernalia suggests the problem:

> . . . I would include in a list of the tools of writing not just writing instruments and paper but also erasers, correcting fluids and tapes, scissors, paper clips, staplers, paste, and clear adhesive tape. Other important equipment includes all the different scraps of paper, index cards, and notebooks that can be used to address reminders to oneself concerning things still to be written (or already written--the control of time again). Different colors of paper and ink can be used to indicate separate parts or different stages of development of a text, and different colored folders

> to contain it all. Two indispensable tools for many writers are a large work space on which all these impedimenta can be spread out (including a separate desk for the awkward bulk of the typewriter and a swivel chair) and a wastebasket, or at least a floor, for disposal of pieces of paper that are no longer required.

While the word processor brings a lot of new baggage with it (disk files, computer tables, printer stands, reference manuals), it can save the writer time. "We don't realize how much time all that housekeeping--fiddling with paper, erasing, retyping--takes," asserts one professional writer; a word processor frees a writer from that" (Cedaring 10). The writer is even freed from most of the physical restraints of typewriting or handwriting. There are no carriages to return, no pages to number, no papers to shuffle, no pencils to sharpen , nothing to erase or cover up with "whiteout."

OUR CHANGING RELATION TO WORDS

Freedom is a psychological state as well as a physical one, and some unique features of writing on a computer monitor reinforce the writer's sense of control. The most easily noted feature is word-wrap or "wrap-around." Essentially, it allows the writer to type continuously without ever having to signal for a carriage return.

Because of "wrap-around," typing on a word processor can be physically easier and faster than conventional typing. Psychologically, wrap-around de-emphasizes the permanent, printed,

lin J and formatted nature of writing. The sentence remains fluid, unsegmented, a continuous chain of words. Most writers, like English teacher Warren Self, stress this fluidity in describing the differences between word processing and other forms of writing:

> My relationship with these words is different from my relationship with words I have written with a pen or a typewriter. The words on my monitor are less permanent; they have motion and a transient quality that alters my psychological relationship with them. They are less like permanent images that must be effaced to be altered, and more like fluid matter capable of many possible shapes and arrangements (19).

Most commentators, such as mass communications professor Lee Nichols, agree that the computer assisted writer is "far more fluid, with less fear of error and a greater willingness to risk, to try out words or ideas" (Biagi 9).

But for some this fluidity is threatening. Predictably, the New York Times writer mentioned above is disturbed by the lack of fixedness: "Scribed electronically, letters are ethereal forms. They appear, disappear, reappear like so many apparitions called forth by the 'Ouija' board at the writer's fingertips" (19). Psychological investigations regarding the effects of working with CRT's do indicate that our relationship to the material is changed by such display parameters as character size, shape, stability, flicker, resolution, luminence, contrast, and chromaticity (Waerm 449).

At first very distracting to a novice on the machine, this eventually becomes part of the word processing gestalt for the computer-assisted writer. Stephen Marcus of California's South Coast Writing Project suggests that students "no longer feel their words to be 'carved in stone' (often the stone of writer's block). Instead, their words now have the quality of light. Students can see their sentences slide back and forth, ripple down the screen, disappear, reappear . . ." (3). We are forced to see words as tools, as machines for our use, rather than magical tokens of reality. Language is itself a tool, a machine. With it we extend ourselves into the world, connect with others using "compatible" equipment, and create meaning.

But we also know that our technologies change us. Elizabeth Eisenstein's two volume work, The Printing Press as an Agent of Change (1979), makes clear how universal were the effects of the adoption of print--how it helped expand the Italian Renaissance to Europe, how it affected the development of capitolism, of exploration, how it changed politics and family life and altered the way we think and communicate. Marshall McLuhan, in Understanding Media (1964) and The Gutenberg Galaxy (1962), has speculated on many of the less obvious ways in which the typographic revolution has affected human consciousness, as has Walter J. Ong in works such as Ramus: Method, and the Decay of Dialogue (1958), Rhetoric, Romance, and Technology (1971) and Interfaces of the Word (1977).

Ong, for instance, points out that the move from orality to literacy put greater stress on the word as a thing, that embedding the word in print made it a commodity, and that "it was print, not

writing, that effectively reified the word and with it, noetic activity" (Ramus: Method, and the Decay of Dialogue 306-18). Unlike the handwritten text, print locks words into space and produces more rational and analytic expectations about the organization and presentation of ideas: according to Ong "manuscript culture is producer-oriented, since every individual copy of a work represents great expenditure of an individual copyist's time. . . . Print is consumer-oriented, since the individual copies of a work represent a much smaller investment . . ." (Orality and Literacy 122-3).

We have already touched upon some similar expectations regarding the shift from hard copy to electronic print, but the effects of this revolution on style and thought have yet to be assessed. The product of word processing is still print, but for the writer it allows new interpretations of the writing process. Paradoxically, it would seem to push writing in opposite directions. On the one hand the writer is encouraged to be more conversational, more personal and expressive; on the other hand ease of revision and a sense of aesthetic distance from ones words encourage a more crafted and audience-directed prose. Word processing seems to assist both emotive and conative styles of writing, both expression and persuasion. Some specific stylistic changes brought about by electronic composing may help clarify this paradox.

CHANGES IN WRITING STYLE

On a word processor the writer is not only free from having to make carriage returns, but from line breaks altogether--as well

as the forces of parallelism, visual repetition, the echo of unintended rhyme, and many of the other usual constraints of syntax. The text moves relentlessly forward into the blank screen. The electronic monitor does not have the spatial rigidity of the printed page (Ong, Orality and Literacy 121-130; McLuhan, Gutenberg Galaxy 79). This wrap-around feature may, in the long run, have as significant an effect on the kind of sentences we write as have the printing press and the newspaper column. Some suggest that sentences might be longer because "overly long Germanic sentences appear shorter on an 80 character screen than they do in print" (Sandberg-Dement). The ease of editing and the limited window of the display, however, may produce the exact opposite effect. It may be some time before we know how how viewing our writing on a computer monitor will effect our style--it took two centuries after the printing press was developed for writers to discover how to consistently manage tone in a written composition (Gutenberg Galaxy 135). Discovering how to fully use the electronic page may be just as difficult.

And then there is the effect of scrolling. Perhaps even more visually shocking than word-wrap, our words not only wrap around the right-hand margin, they scroll out of sight at the top of the screen. Just as speech exists in a momentary window in time and then disappears, words on a word processsor can be viewed only through a small spatial window (typically no larger than 24 by 80 characters). The situations are not exactly parallel, for the spoken word "exists only when it is going out of existence" (Orality and Literacy 71), while the words on the screen hang around a bit longer. Still, we write with only a small portion of

the whole in front of us, and it slowly scrolls out of existence--at least visual existence. Some writing instructors have exaggerated the effect by having students switch off their monitors altogether, creating a kind of "invisible" writing that stresses the importance of prewriting by discouraging "local editing" (Marcus 2). This also brings to mind the experiment in which James Britton found that skilled writers who were forced to use a stylus on a ditto master (so they could not see what they had written) could not write with extended coherence. Like wrap-around, this feature will undoubtedly have an effect on our writing behavior.

Another possible stylistic shift is related to what some have called the "autonomous" (Olson) or "context free" (Hirsch 26) quality of the printed or written word. Such terminology has been challenged, since no one ever writes in a vacuum. (If we don't have an audience, we invent one.) Yet the phrases have a certain metaphorical validity: they make clear that the written word cannot be questioned as oral speech can. A book that states a boldface lie continues to exist no matter how devastatingly we refute it. Thus, the electronic passage before us on the monitor might be seen as even more cut off from any context.

And yet many writers seem to feel that writing on a word processor produces a more natural voice, one that seems to have some of the characteristics of speech: "My style has become more open (some might say breezy)," says English teacher Charles Moran, and it "has more of the rhythms of spoken language in it" (114). It is difficult to immediately see why this might be the case. We cannot easily place the effect of the word processor on a simple

continuum relating to oral or written language, to print or electronic media, to the aesthetic or the referential. On the one hand electronically assisted writing seems to be more spontaneous and ephemeral--like the spoken word; on the other hand, ideas thrown up on the monitor have a kind of otherness, as if we didn't really put them there. They are easy to question and change. The writer is always involved in a dialogue with ideas on the word processor, a dialogue which might logically encourage more of the conversational quality of speech. And when the electronic text is refuted (with the delete command) it does not continue to exist.

Unlike the case with ordinary speech, however, the limited window on our words will not necessarily be detrimental to coherence. The writing environment encourages a dialogue with writing that tends to require more coherence. We can always "scroll" the materials back in front of us at any time. We are able read reflexivly, to employ the "backward scanning" habit that many have seen as an essential element in aesthetic reading. This self-refering quality seems the antithesis of casual speech. Furthermore, the split-screen technique, a variation on windowing, has the same reflexive effect. One is able to display duplicate versions of a text and then revise one, keeping the original in sight. When we work on a word processor, we can always put our text into a context.

Thus in a sense we can enjoy the spontaneity and linearity of speech, the sense of creating something totally new, from nothing, at every moment, while remaining within the self-conscious world of art, always able to recall and hold in focus all that we have written. We can move both vertically and horizontally through

language, view our sentences both synchronically and diachronically. It is as if the cursor denotes a "slot" in the sentence, a reference point at which (by scrolling) we can escape the pressuring syntax of the linear, horizontal, forward-pushing line. The continuous scrolling of words generates a sense of continuity and flexibility which, like the wrap-around capability, does not impose the usual formal constraints on the writer, either of line or paragraph or page. And yet word processing stresses the reflexive, reiterative, poetic, quality of language even more than conventional page-bound text.

This paradox is similar to the dichotomy which has been at the heart of most of the approaches to writing and literature in this century. Modern linguistics has been wedded to this notion of polarities ever since Saussure spoke of the syntagmatic and associative planes of language in his "Course in General Linguistics." And Roman Jakobson, writing about aphasia in 1956, made an observation that became the foundation for current notions about the differences between the aesthetic and the functional in written language: the two major component disorders of the disease were strikingly related to the basic rhetorical figures of metonymy (the substitution of the part for the whole) and metaphor (the combination or fusion of contexts), and Jakobson related them to the two axes of language: the horizontal, syntagmatic, combinative or metonymic axis, and the vertical, associative, selective or metaphoric axis.

The horizontal or syntactical force of the sentence drives the speaker or writer onward, forces closure, demands an ending. This kind of language is a public medium; it involves a social

contract of sorts: if we are to engage in the thing called language we are obliged to make a certain amount of sense, to follow the rules of usage and sentence structure. The opposite axis, the vertical or associative dimension of language, encourages a more subjective and personal expression. At every given lexical "slot" in the sentence a continuum of words comes to mind, a set different for every speaker or writer. The specific words we choose will also be determined by the immediate context of the sentence with regard to our audience, our purpose, our emotional state, and so forth. We may even break new semantic ground by forcing an unexpected combination of contexts, as in the use of metaphor. Jakobson's famous definition of the poetic function of language as that which "projects the principle of equivalence from the axis of selection into the axis of combination" (Style in Language, 91-2), is formulated on the basis of this primary division of language modes. The point is that language is at its most effective when it defeats our common-sense expectations, when it dislocates or dislodges our normal channels of perception. In good art and effective writing the metonymic is always a little metaphorical and the metaphor is always approaching metonymy.

Writing on a word processor seems to combine language principles in much the same way. In one sense it is a "vertical" kind of writing. We can easily scroll and select from a series of similar choices, substituting and merging ideas throughout the text. On the other hand, the convergent restraint of syntax is not absent. Although we focus intently through a narrow window on a small segment of our writing, we are always aware of the rest of

the text, of the context which surrounds our immediate words. Writing on a word processor is the antithesis of autonomous or context-free writing. Nothing seems to stand in isolation. The word processor allows writers to engage in divergent thinking, to create and discover their ideas, while still providing the checks and controls needed to begin to converge, to come to some closure.

A SENSE OF OBJECTIVITY AND AUDIENCE

Word processing helps writers gain such closure by encouraging a kind of objectivity concerning their own words, a sense of aesthetic distance. We have already suggested that the machine encourages a dialogue between writers and their ideas. Daiute goes further and suggests that the processor helps us take a reader's point of view in revising (134). The impersonal language of word processing hints at this distancing (we talk of input, of data and data bases, of information and files, of bits and bytes). When we realize that our words are only discrete bits of information to the computer, perhaps they are more easily edited. Whatever the reason, the computer encourages a kind of self-monitoring (Daiute 134). Perhaps this is because it helps separate what Peter Elbow calls the creative and the critical processes; it allows time for prewriting, for discovery, as well as revising and editing.

It also allows us to change perspectives. When we make a "hard copy" of our text we gain a new focus, like switching points of reference on a drawing of a transparent cube (do we see it from below or above ?) or flipping from Duck to Rabbit, Vase to Faces, or Old Hag to Young Woman in various familiar figure-ground

puzzles. Most writers who use word processors do not "wean themselves away from paper" as William Zinser (author of the best selling Writing on a Word Processor) seems to suggest to be inevitable and preferred. Warren Self, already quoted above about his changing attitude toward words, argues that when he prints out his draft on paper it seems different from the one he had been composing on the screen: "That difference makes my reading of it a new experience and allows me to see the text in a new way; I do not feel as if I am reading my text again; rather, I feel as if I am reading a text for the first time, for it is the first time I have seen it in that physical form" (20). Alvin Toffler, who switched to a word processor half way through the writing of The Third Wave, voiced similar feelings about seeing his words on paper: he felt he came closer to "seeing them as a reader while still working as a writer" (Courter 41).

The writer can also gain a sense of audience because the electronic page is displayed on a CRT, a cathode ray tube or television screen. The television is a public medium, a "cool" medium. When our words appear there, they too are public. And we can revise and edit with greater objectivity. It is almost as if we gain an immediate sense of audience. Putting words on the screen provides a kind of "publication," a means of testing ideas. However, this perceived public domain has its drawbacks. Total strangers--who wouldn't think of peering over your shoulder as you write with paper and pen-- are likely to stand behind you as you work on a word processor, reading what you write. Zinser speculates that because we have become a society of TV viewers, the tube belongs to everyone and "this makes writing a public

act . . . " (44). Perhaps this is why we are able to peer over our own shoulders more easily when we write on a word processor. It is impossible to think of the traditional rhetorical acts of Invention, Arrangement, and Style (inventio, dispositio, elecutio) as separate and distinct stages when writing on a word processor. Invention is a constant, reflexive process, one that takes place at every moment in our creation of a text. We tend to see writing as a totally integrated structure of activities because of the word processing gestalt. The electronic page is a medium that "favors the presentation of processes rather than products" (Understanding Media 39). But while it encourages a process-oriented thinking, the process is not necessarily linear. We discover our meaning even as we play with organization and style. Revision and invention take place at every stage of the process. Contrast this to Ong's assertion that print, typing and even writing, always encourage "a sense of closure, a sense that what is found in a text has been finalized, has reached a state of completion" (Orality and Literacy 132).

PLAYING WITH WORDS

Our ideas are created in our working and playing with language. When we compose on a computer, words become tools we can use without anxiety. Even in the most straight-forward expository prose, we are encouraged to manipulate language. We are thus naturally encouraged to consider our writing more aesthetically. The word processor, in emphasizing language as a kind of raw material, a pigment on the compositional palate, frees writers and

thinkers from a static commitment to their words. Composing on a word processor is like painting with oils. The colors blend. The results are palimpsistic ("rubbed again"--we can literally write over our words), a layering of drafts. The writer continues to revise and rethink up to the very last keystroke. John Hersey, one of the first well-known novelists to turn to word processing, suggests that word processing allows you to "keep the text open for weeks on end, putting in changes whenever you wanted, trying things, rejecting them later if they had no holding power, comparing versions--as if you were dealing with what a story should be, something alive" (Courter 41). Just as the visual artist can manipulate the painting with rag and turpentine, the writer can sweep through the text blending new ideas and erasing others.

The painting analogy is a good one. It points to an interesting visual and graphic component of word processed writing. Just as Gutenberg's moveable type created a new spatial pattern for writing, a new structure for organizing and creating ideas, so the visual gestalt of the processed electronic page will alter the way we "see" writing. Small things may become immediately obvious: shorter paragraphs for instance. Because we are limited to 24 lines, most paragraphs will fall within that limit, primarily because we are so committed to the paragraph as a structural unit and we want to see the whole of it on the monitor. I think subheads will also become more accepted. The scrolling pages cry out for definition by an occasional subhead just as the difficulty in reading manuscripts eventually created the paragraph. These are only the more obvious effects. Ellen

McDaniel points out that it took years for writing to stop imitating oral language, and word processing programs still imitate the typewriter and the printing press.

Thus we have probably not yet experienced the full stylistic potential of electronic writing. However, I think another clear tendency, as evidenced by the changes in hardware (the Macintosh for example) will be a new emphasis on graphics. Word processing programs will include Macintosh-type graphics, and with them will come the ability to easily integrate graphics and text, perhaps to let a picture speak for a thousand words. Perhaps words will become more like things, exhibiting what Jakobson called the "palpability of signs." Word processing may thus counter-balance the tyranny of the typographic.

McLuhan made the point that the printing press, with its emphasis on the visual senses, tended to artificially separate the visual from the rest of our senses. Word processing does not seem to have a similar limitation. The "mouse" and touch sensitive displays may be indications of what lies ahead. Word processing already can be a kind of finger-tip thinking, and the whole body could be more important in the way we write and think with computers in the future. In What Computers Can't Do, a 1972 critique of Artificial Intelligence research, Hubert Dreyfus found digital computers limited "not so much by being mindless, as by having no body" (xii). Human beings are not limited in their learning to what they can express in rules--they learn through their bodies as well. Interestingly enough, Seymour Papert, the developer of LOGO and one of the MIT researchers in Artificial Intelligence criticized by Dreyfus, now seems to agree. He argues

in Mindstorms that the most effective thinking uses the whole body in what he calls "body geometry" and "syntonic learning" (58, 963). The word processor appears to encourage just such a kind of learning.

In The Silent Language Edward Hall suggested that "all man-made material things can be treated as extensions of what man once did with his body or some specialized part of his body" (Hall 79). In some cases the computer has literally become such a physical extension, an "enabling" device. Mark O'Brien, a quadrapelegic from Berkeley, writes that the word processor ranks second only to his power wheel chair in enabling him to overcome his physical limitations. And yet, what he writes about word processing seems to express only in the extreme what most writers feel, a sense of freedom and power: "My first try at rearranging a sentence gave me a sense of immense power, a feeling that can best be appreciated by quadriplegics living in a world designed by ad for able-bodied people" (47).

Obviously, all this is very speculative. We still need more studies of the effects of word processing on writing. But it is clear that working with a word processor changes our behavior as writers. We compose more easily, less anxiously, and more prolifically. The word processor makes us want to sit down and write. It makes us feel good about our writing. It does this, we have seen, by encouraging prewriting and invention, by providing us with a sense of control and mastery over the actual writing process, by easing the burden of rewriting and editing, and by encouraging a kind of objectivity that allows us to become our own audience. In the process our style of writing may be changing,

becoming more like ordinary language in its spontaneity, and yet more reflexive and contextualized; more self-referring and aesthetic, and yet more open and fluid--more like painting with oils than acyrlics. Perhaps the reflexivity of the new writing even suggests a thinking that is both divergent and convergent, spontaneous and analytical, specific and holistic, a more bodily thought.

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